DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
Quarterly Report

May 28, 2009

TO: Tonnie Cummings, Project Lead, Water Quality Program, SWRO

FROM: Stephanie Brock, Project Manager, Environmental Assessment Program

THROUGH: George Onwumere, Unit Supervisor, Environmental Assessment Program

SUBJECT: Burnt Bridge Creek Total Maximum Daily Load (TMDL), Quarterly Progress Report #3

Project Code: 08-029-01-03

Introduction

Burnt Bridge Creek and its tributaries lie within Water Resource Inventory Area (WRIA) 28 in southwestern Washington. Burnt Bridge Creek flows from east to west through the City of Vancouver draining approximately 27.6 square miles. From its headwaters near NE 162nd Avenue, Burnt Bridge Creek flows 12.7 river miles to its confluence with Vancouver Lake near Interstate-5 (Figure 1). The study area includes 16 waterbody segments impaired by *fecal coliform* bacteria, dissolved oxygen, and temperature, as listed in the 2004 Clean Water Act Section 303(d) list. The draft 2008 303(d) list adds 12 segments impaired for *fecal coliform* bacteria, temperature, dissolved oxygen and pH. The impairments were identified based on sampling conducted by the City of Vancouver, Clark County, Ecology, and other entities. Field work for this study began in May 2008 to assess the current condition of the waterbodies and to identify and quantify factors contributing to the impairments.

This memorandum summarizes the progress for Quarter 1 (January - March) 2009 related to data collection and project communications. Data presented are provisional. Data quality has not been checked.

Progress to Date

Dissolved Oxygen, Temperature, Bacteria and Hydrogeology Data Collection

Field data collection began during the week of May 19, 2008 and will continue through August 2009. Figure 2 shows fixed-network sites where routine sampling occurs. Table 1 lists the sampling sites. Table 2 lists the types of data collected at each site and the site status.

The routine monitoring for fecal coliform bacteria that began in June 2008 has continued through March 2009. Samples were collected from the Burnt Bridge Creek and its tributaries twice a month during January through March 2009 and analyzed for fecal coliform bacteria (Table 3). During this quarter, samples collected at the following sites had concentrations greater than 200/100 mL on at least one occasion:

- BBC10.4
- BBC5.9
- BBC2.6
- PET0.0
- BBC5.2
- COL0.0
- BUR0.0
- BBC4.3
- BBC1.6
- BBC7.0
- BBC3.4

The instream piezometers and thermistors continued to log through the 1st quarter of 2009. Dissolved oxygen samples were collected at most sites during each bacteria sampling run. Additionally, instantaneous dissolved oxygen, temperature and pH were measured at each site during site visits.

During the next quarter (2nd quarter 2009) the following activities are expected to commence for the study:

- Bi-monthly samples and flow measurements will be taken at all sites
- Weather forecasts will be monitored in order to sample during storm events
- Temperature data will be downloaded from instruments at all sites
- Water levels will be measured and compared between the instream piezometers and stream surface

Provisional Results

Table 3 provides provisional data compared to water quality criteria for each site for bacteria. Data collected to this point, inidicate that all sites, except PET1.3, violate one or both parts of the water quality criteria for fecal coliform bacteria.

Communication and Coordination

- Presented status of field work and preliminary data to the Burnt Bridge Creek Technical Advisory Committee on March 11, 2009.
- In April, the City of Vancouver identified an illicit connection from VFO to the storm system. They worked with building owners and tenants to correct the problem.

Project Schedule and Upcoming Tasks

Routine bacteria and streamflow sampling will continue until August 2009. During this time, piezometer/surfacewater gradients will be measured on occasion and instream thermistors will be redeployed as needed.

Stormwater sampling remains necessary to complete the study. Two stormwater sampling events remain, including 1) bacteria and streamflow data collected twice during one storm event and 2) a dry season storm sampled once for parameters such as nutrients, bacteria, total organic carbon, dissolved organic carbon, total suspended solids, and streamflow.

Attachment(s):
Table 1. Burnt Bridge Creek TMDL fixed network sampling locations.
Table 2. Sampling locations, routine data type collection and, status of continuous, temperature logging.
Table 3. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results.
Figure 1. Burnt Bridge Creek study area with 303(d) listed waterbody segments.
Figure 2. Burnt Bridge Creek TMDL fixed network sampling locations.

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Tables

Table 1. Burnt Bridge Creek TMDL fixed network sampling locations.

		NAD 83	
Site ID	**Description**	**Latitude**	**Longitude**
BBC0.0	Burnt Bridge Ck downstream of Fruit Valley Rd	45.67520	-122.69253
BBC1.6	Burnt Bridge Ck at 2nd Ave near Alki Rd	45.66137	-122.66934
COL0.0	Cold Creek at Hazel Dell Ave BBC RM 1.6	45.66174	-122.66827
BBC2.6	Burnt Bridge Ck at Leverich Park	45.65339	-122.66180
BBC3.4	Burnt Bridge Ck near SR 500 at 41st Cr	45.65250	-122.65034
BBC4.3	Burnt Bridge Ck upstream of Saint Johns Blvd	45.64745	-122.63946
BBC5.2	Burnt Bridge Ck at Rossiter Ln	45.64112	-122.63094
BBC5.9	Burnt Bridge Ck at NE 18th St	45.63469	-122.62405
BBC7.0	Burnt Bridge Ck at NE 65th Ave	45.63456	-122.60497
BBC8.0	Burnt Bridge Ck NE 86th Ave, dwn/strm of Burton Ch.	45.63523	-122.58489
BUR0.0	Burton Channel at BBC RM 8.3 19th Cr & 92nd Ave	45.63672	-122.58121
BBC8.4	Burnt Bridge Ck at NE Burton Rd, blw Peterson Ditch	45.63802	-122.58246
PET0.0	Peterson Ditch confluence at 93rd Ave, BBC RM 8.8	45.64501	-122.57767
PET1.3	Peterson Ditch at 102nd Ave (SEH outfall 001)	45.65207	-122.55736
BBC8.8	Burnt Bridge Ck above Peterson Ditch at NE 93rd Ave	45.64468	-122.57837
BBC9.5	Burnt Bridge Ck at 98th, up/strm of Royal Oaks Dr	45.65148	-122.57191
BBC10.4	Burnt Bridge Ck at NE 110th Ave	45.65809	-122.55974
BBC10.8	Burnt Bridge Ck at NE 121st Ave	45.66031	-122.54881
BBC11.4	Burnt Bridge Ck at 131st Ave	45.66308	-122.53808

Table 2. Sampling locations, routine data type collection and, status of continuous temperature logging.

Site ID	Bact.	Stream Temp.	Air Temp.	RH	Piezo.	Streamflow Inst.	Streamflow Cont.	Temp. Data Logging Status
BBC0.0	x	x	x	x		x		ending[1]
BBC1.6	x	x	x		x	x	x	on going
COL0.0	x	x	x			x		ending[1]
BBC2.6	x	x	x		x	x		on going
BBC3.4	x	x	x	x	x	x		on going
BBC4.3	x	x	x		x	x		on going
BBC5.2	x	x	x		x	x		on going
BBC5.9	x	x	x		x	x		on going
BBC7.0	x	x	x		x	x		on going
BBC8.0	x	x	x			x		ending[1]
BUR0.0	x	x	x	x		x		ending[1]
BBC8.4	x	x	x	x	x	x	x	on going
PET0.0	x	x	x			x		on going
PET1.3	x	x				x	x	on going
BBC8.8	x	x	x		x	x		on going
BBC9.5	x	x	x		x	x		on going
BBC10.4	x	x	x		x	x	x	on going
BBC10.8	x	x	x		x	x		on going
BBC11.4	x	x	x	x	x	x		on going

Bact.= *fecal coliform* bacteria, Temp.= temperature, RH= relative humidity, Piezo.= piezometer, Inst.= instantaneous, Cont.=continuous.

[1]Continuous tempertature data logging will resume May 2009 and end August 2009.

Table 3. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results. Data have not been quality assured.

Station ID	6/3 to 6/4/2008	6/17 to 6/18/2008	6/30 to 7/1/2008	7/15 to 7/16/2008	7/29 to 7/30/2008	8/12 to 8/13/2008	8/26 to 8/27/2008	9/9 to 9/10/2008	9/23 to 9/24/2008	10/6 to 10/7/2008	10/20 to 10/21/2008	11/3 to 11/4/2008	11/17 to 11/18/2008	12/1 to 12/2/2008	12/15 to 12/16/2008	12/28 to 12/29/2008	1/12 to 1/13/2009	1/26 to 1/27/2009	2/9 to 2/10/2009	2/23 to 2/24/2009	3/10 to 3/11/2009	3/23 to 3/24/2009	number of samples (n)	geometric mean	90th percentile	% samples exceed WQ Criterion
BBC11.4	3200	120	190	80	46	22	69	29	57	26	35	47	11	3	7	400	6	4	43	11	1	8	22	30	287	9
BBC10.8	1500	85	110	96	93	47	63	31	28	41	20	20	5	6	7	200	9	8	6	9	3	12	22	27	182	5
BBC10.4	1400	92	160	100	40	220	150	40	69	190	280	120	14	10	29	560	23	11	7	230	7	17	22	64	422	23
BBC9.5	1900	46	92	81	37	100	71	41	51	88	430	210	15	7	8	680	20	3	41	100	10	5	22	50	389	18
BBC8.8	3200	38	65	35	44	75	110	40	37	63	180	140	26	21	13	570	17	8	21	6	7	11	22	44	290	9
PET1.3	880	8	5	18	27	1	11	13	3	16	3	19	280	3	1	29	1	3	1	8	1	1	22	7	72	9
PET0.0	4200	130	69	220	220	320	270	250	550	370	1100	280	250	700	63	85	120	80	67	300	96	160	22	227	837	59
BBC8.4	3000	25	96	140	85	100	100	120	180	100	300	110	110	110	15	300	34	34	25	150	29	110	22	97	402	14
BUR0.0	3900	230	140	130	170	200	990	160	200	290	6300	130	100	430	57	330	23	27	150	160	24	470	22	203	1214	36
BBC8.0	2600	110	74	67	61	77	96	160	23	79	790	69	62	16	47	350	37	20	37	77	27	95	22	81	365	14
BBC7.0	2300	25	120	63	120	160	49	7	15	44	96	400	5	290	17	260	6	15	15	290	9	84	22	54	423	23
BBC5.9	1800	850	92	96	66	79	180	100	66	46	46	620	21	160	13	100	47	9	10	490	9	66	22	79	506	18
BBC5.2	870	300	92	210	65	84	200	140	200	77	56	520	100	350	26	600	31	21	240	360	250	87	22	142	525	41
BBC4.3	1100	130	130	120	110	100	190	270	200	150	170	480	40	600	43	1400	24	54	53	330	7	88	22	134	650	27
BBC3.4	830	75	110	110	100	88	140	270	150	170	92	340	29	480	80	6700	96	43	48	560	14	51	22	138	732	27
BBC2.6	1000	280	120	230	330	170	220	280	180	120	110	310	18	500	49	12000	16	33	51	440	29	64	22	158	1041	45
COL0.0	380	85	180	510	470	420	300	260	260	220	160	340	100	180	37	350	27	110	260	220	33	88	22	173	519	55
BBC1.6	670	130	140	420	140	140	160	260	260	270	120	330	34	440	63	12000	8	36	40	310	32	60	22	151	975	41
BBC0.0			9	65	17	13	180	37	29	36	18	240	10	33	22	230	23	43	31	150	25	75	20	39	138	10

Gray shaded cells exceed 200 cfu/100 mL and **yellow shaded cells** exceed the WQ criteria

Figures

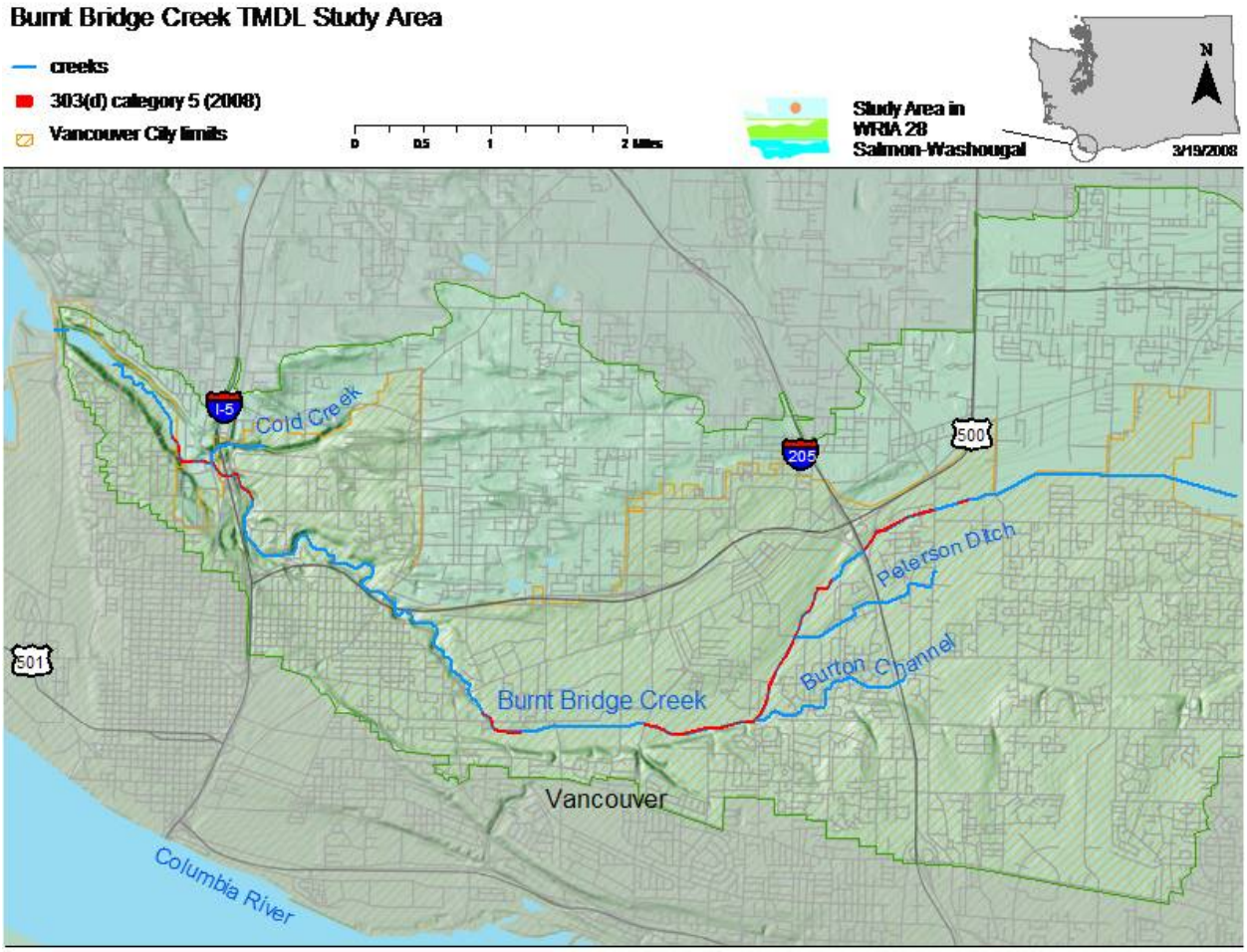

Figure 1. Burnt Bridge Creek study area with 303(d) listed waterbody segments.

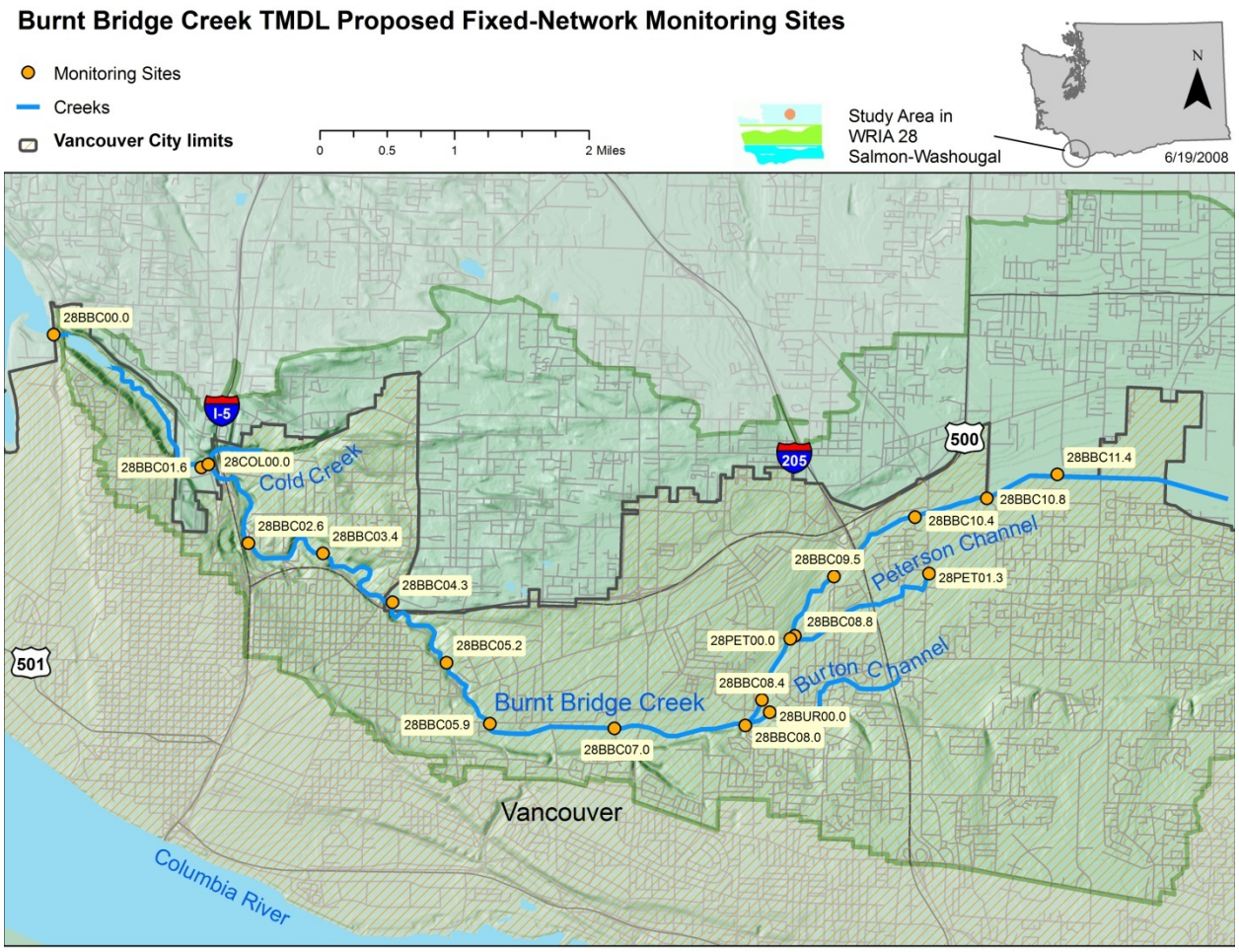

Figure 2. Burnt Bridge Creek TMDL fixed network sampling locations.